

MEETING NOTICE

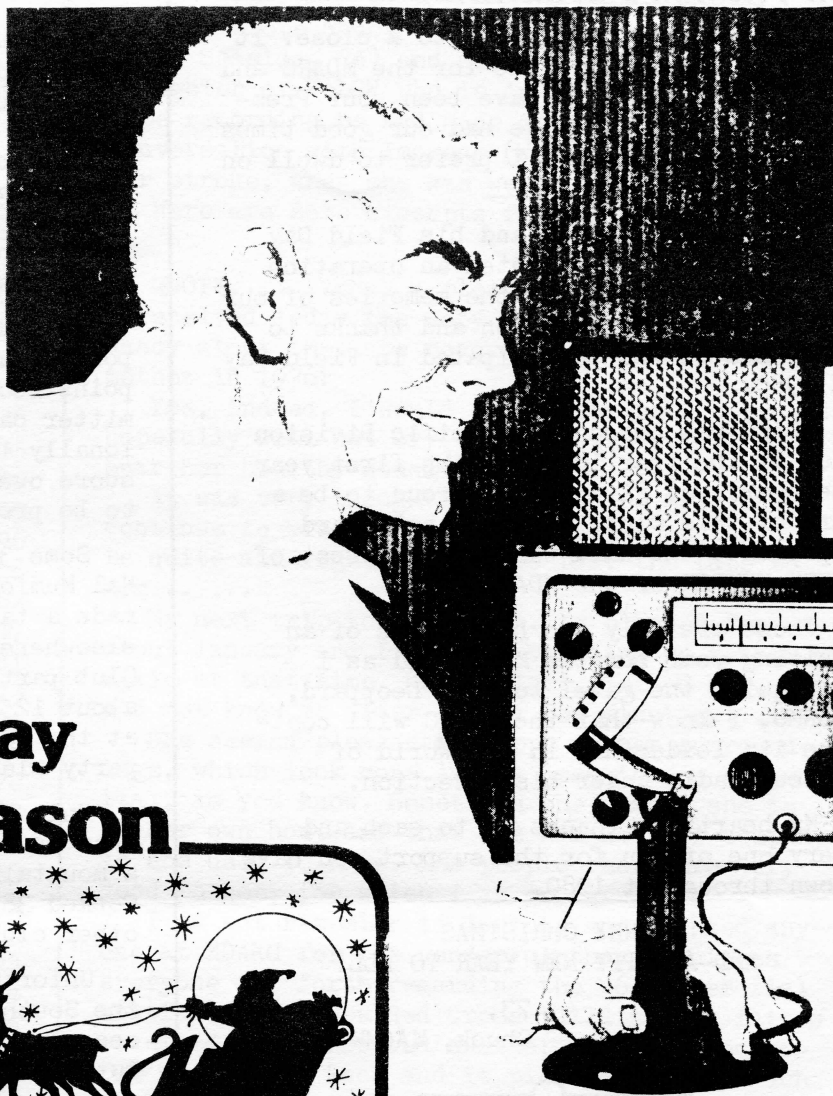
Ordinarily club meetings are held at
the Grace Presbyterian Church
2100 Tice Valley Blvd.,
Walnut Creek
on the third Friday of each month
at 8:00 P.M.

Because of the December 14, 1980
Christmas Party, the regular
December club meeting was not held.
The next meeting will be held on
JANUARY 16, 1981

Northern California Emergency Net:
Sunday morning at 1000 on 3.920 MHz.

CIVIL DEFENSE

Emergency Frequency: 146.985



Have A Happy Holiday Season



the CARRIER.....

Published Monthly by the Mount Diablo Amateur Radio Club

MDARC FIELD DAY CALL W6CX; 2M REPEATER WR6AHK; 220 REPEATER WR6ARG; MEMORIAL CALL SIGN W6LGW

Volume XXVIII

December 1980

No. 12

EDITOR: Clay Stiles, WD6GDG P.O. Box 23222, Pleasant Hill, Calif. 94523 Phone: 934-4553

PRINTER: Doug L. Lortsher, W6KLM 3357 So. Lucille Ln., Lafayette, CA 94549 Phone: 283-2219

President.....	WA6MWU, Chuck Welch	102 Rolling Green, Pleasant Hill,	94523 676-5262
Vice President.....	WA6IRZ, Stan Bringer	1920 Gilly Lane, Concord,	94518 689-0989
Secretary.....	KA6AHO, Judy Stewart	P.O. Box 23222, Pleasant Hill,	94523 798-9195
Treasurer.....	W6CU, Hal Mumford	1271 Walker Ave., Walnut Creek,	94596 934-4728
Emergency Coordinator..	W6LKE Dwayne Eskridge	P.O. Box 5502, Walnut Creek,	94596 932-3971
Board Member.....	WA6GON Doug Smith	1369 Tree Garden, Concord,	94518 unlisted
Board Member.....	K6XC Ron Luttringer	440 Diablo Court, Martinez,	94553 229-3987

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Next Board Meeting at: C.C. County O.E.S. Building, 50 Glacier Dr., Martinez, Dec. 22, 8 P.M.

Deadline for next issue: Articles and Classified Ads by December 26, 1980.

The President's Corner....

Another year is drawing to a close. It has been a memorable one for the MDARC and I have been proud to have been your President for 1980. We have had our good times and our bad times but I prefer to dwell on the good.

Don Doughty, W6EEN and his Field Day crew, planned and executed an operation that will live long in the memories of our MDARC members. Thanks Don and thanks to every member who participated in Field Day of 1980.

MDARC was named ARRL Pacific Division Club of the Year in 1980, the first year the award was given. I am proud to be a part of this Club, because that award represents the hard work and interest of EVERY MEMBER of the MDARC.

Those are only two highlights of an exciting year for the MDARC and as I relinquish the gavel to Bill Leppard, WB6NMU, I know that the MDARC will continue its leadership in the world of Amateur Radio under his direction.

My heartfelt thanks go to each and every one of you for the support you have shown throughout 1980.

MERRY CHRISTMAS
AND A HAPPY NEW YEAR TO ALL!

73,
Chuck, WA6MWU

INCREASING THE CLUB TREASURY.....

When I first heard of the suggestion to save used aluminum cans for recycling and add the proceeds of the sale to the club treasury, I thought, as perhaps many more club members thought, it would take months to accumulate enough to make it worth the effort.

Doug Smith, WA6GON was the originator of this idea and through his untiring and persistent effort managed to increase the allotted \$50.00 that was allocated by the club for the Awards Committee to \$115.00.

In addition to the very few members who brought in a contribution of soft drink, beer and other cans, Doug talked a couple of grocery markets into saving their cans for him and along with the cans he scraped up at his job as a dispatcher for the Concord Police Department, he sold the lot

FIELD DAY 1980 RESULTS - W6CX

A group of 55 stalwart members of the club journeyed to the top of Mt. Diablo the weekend of June 28-29 to put W6CX on the air for the ARRL Field Day drill. Six towers and a multiplicity of monobanders and wires saw us operating QRP on all bands from 10M through 80M and on 2M, 220 and 450. Bonus points were earned for publicity, traffic handling, solar power and fast scan TV.

We made a total of 2598 QSO's and 18,420 points, about 13 percent more than the old point record. We operated in the 7 transmitter category and had the high score nationally in this group and we were the high score overall in our section. We have much to be proud of.

Some 38 Club members operated W6CX and Hal Mumford, W6CU, trustee for W6CX, has made a tabulation of individual efforts elsewhere in this issue of the Carrier. Club participation was high this year with about 125 visitors logged over the weekend at the mountain top. A Friday nite press party also was well attended...

Only one other station scored more points than we did. Operating QRP with 8 rigs from a mountain top near Santa Barbara N6IV/6 worked 3857 Q's for 27,625 points to lead all other clubs in all categories.

Unfortunately, this super performance by the Southern California Contest Club made us second, something we did not plan to be.... but, oh well, there is always next year!!!!

W6EEN, 1980 Field Day Chairman

for \$65.00. All this occurred in about a month's time.

Doug certainly deserves a pat on the back, if not two and just think what we could do if all of us made it a point to collect these aluminum discards instead of letting the garbage department haul them to the dump.

In addition to cans, anything made of aluminum metal such as scrapped antenna parts, dilapidated (and dangerous) step ladders, old pots, refrigerator ice trays and numerous other aluminum articles, all would add to the weight for profitable sale to the recycling stations.

Lets all give it some serious thought.

73, Clay, WD6GDG

W6CX 1980 FIELD DAY TABULATION

By: W6CU, Trustee for W6CX

Here's a list of operators, ranked according to the points they made for the Club during F.D. as indicated by the F.D. log. CW counts as 2 points; Phone as 1.

Operator	Total Points	Number of Contacts		
		CW	Phone	Total
K6OYE	508	250	8	258
AI6V	421	96	229	325
WB6DHH	266	107	52	159
K6KAP	220	92	36	128
WB6ONN	178	89		89
KB6OH	152	76		76
KB6YF	149	14	121	135
W6EEN	125	5	115	120
KD6DY	99		99	99
WA6NTG	96		96	96
WB6YRD	88		88	88
WA6SJS	87		87	87
K6XC	83	36	11	47
WB6CVJ	82	1	80	81
KB6TP	81	8	65	73
KA6IVG	81		81	81
WD6EMK	76		76	76
KA6GBM	70		70*	70
WA6YOP	70	7	56	63
WA6SWO	62	31		31
KA6IZI	53		53	53
WD6CIZ	52		52	52
WA6YXY	50		50**	50
KA6ECK	46	23		23
WA6GON	44		44	44
KA6AOC	38	2	34	36
N6CKM	37		37	37
WD9BIV	30		30	30
KF6R	26	13		13
KA6FEJ	22		22	22
KB6UY	20		20	20
"ART"	18	6	6	12
WB6PQM	10	5		5
KB6YO	8	4		4
N6AJV	8	1	6	7
WB9VRF	6		6	6
W6NKF	4		4***	4
WB6TEE	1		1	1

* Two contacts were by solar power.

** One contact was by solar power.

*** Contacts were by Fast Scan TV.

Besides our Novice setup (KA6ECK), we had a maximum of 7 stations on the air at any one time. All rigs used batteries and 10 watts or less. We had about 20 different antennas at our QTH on top of Mount Diablo.

Under the efficient leadership of Don Doughty, W6EEN only one club (of the 1791 contestants in the U.S. and Canada) rated higher than our W6CX official ARRL score (with its bonus points) of 18,420.

DAUGHTER OF W6LGW WRITES FROM HOLLAND

W6CU wrote Nancy (granddaughter of W6LGW who is in Seaside, CA) and Mary Ellen, W6PIR (daughter of W6LGW who is in Holland) about a tape recording he had made of a 23 minute conversation with Imogene (W6LGW's XYL) prior to her stroke, when she was well.

Here are some excerpts from W6PIR's reply:

October 15, 1980

QUOTE.....What a pleasant surprise when I received today the copy of your letter to Nancy about the tape recording you made of my mother in 1976!

Yes, indeed, I would enjoy hearing a copy and hopefully will not cry too much whenever I do hear her healthy-sounding voice.....

It was very thoughtful of you and Mildred to continue to visit my mother. I think it would be quite all right for you to play the tape to her.....

My next trip to the U.S.A. is planned for about January and I will be visiting my mother again at that time. When I last visited her, she did not know me after just a few minutes.....

She seemed pleasantly happy in her surroundings, which look more like a home than a hospital, as you know. Sometimes she thinks she is in her own home and that she has lots of company as she used to have. The people there are very good to her, for which I am grateful.

I do not remember if I wrote and thanked anyone at MDARC for the wonderful thoughtfulness everyone put forth regarding the W6LGW memorial station at the new Red Cross building. My father received many deserved awards; he was a wonderful man as you know and it pleased me very much that the MDARC gang thought so highly and fondly of him. My mother never did recover from his passing. Their lives were so intertwined that one of them without the other was almost half a person - they went everywhere together. Maybe it partly was her broken heart that also broke other things, as now science is finding out that depression and unhappiness cause other illnesses.

I still maintain my ham radio license, although I have not used it for several years. Just recently I got around to sending the modification for it for the new name! I keep a permanent address in California for things like that. Maybe some day I will do it again... go on the radio, that is! My husband and I will be in Holland for about another year or so. One year has already gone by.....

Please give my regards to the MDARC folks....

Most sincerely,

Mary Ellen (Peterson) Wirkkunen
"Stella", W6PIR.....UNQUOTE

(W6PIR was editor of the Carrier for 82 of the issues printed between 1956 and 1969).

MINUTES OF MDARC MEETING OF NOV. 21, 1980

The meeting was called to order at 8:01 p.m. and was thoroughly and efficiently handled by our President Chuck Welch WA6MWU.

Visitors were introduced, one of which was an MDARC "Southern Chapter" member Dave Bauerle, who later with some of our loyal local members paid dues for 1981.

Elegant and beautifully printed MDARC membership certificates with large neatly typed names are ready for pickup at meetings. There will be no auction this fall because no reasonably-priced auction QTH was found.

Motion passed that we remove from the table the subject of a dues increase, and the three petitions (see previous CARRIERS) on \$12 annual dues, \$10 annual dues, and \$7.50 annual dues were unbiasedly presented and adequately discussed. It was explained that passage by a 2/3 vote was necessary. One point at issue during the discussion was the sometimes slow delivery time of the lower cost THIRD CLASS mail as exemplified by the November CARRIER. The motion did not pass (34 to 32) that dues should be \$12 per year.

The motion passed (51 to 13) that our annual dues be \$10. An added family-member type dues will be \$5. Additional family members then may join for \$2.50 (all at the same address to which one CARRIER is to be sent).

Treasurer's Report: All bills that have been presented are paid. We have \$689.15 which is believed to be sufficient to pay bills that will be presented between now and the end of the year, but this is about \$400 less than what we had last year on Nov. 21. Emergency Coordinator Dwayne Eskridge W6LKE is supervising the installation of a \$42,000 communications console for the Walnut Creek Police Dept. MDARC awards will be in the lobby at the Red Cross building. Dwayne presented certificates to WA6ZFZ (EC for Eastern Contra Costa County) WB6JGV (EC for the RACES group), and WA6GON (Red Cross liaison).

Appreciation was expressed toward our new editor Clay Stiles WD6GDG and our printer Doug Lortsher W6KLM for a superb CARRIER.

Awards and certificates for quite a few members are planned for our Christmas Party, it was announced by Doug Smith WA6GON.

A 1981 Door Prize Chairman (an interesting job) is needed, it was announced by WA6TXM.

Education: Gerry Nanbu stated that there would be one more class for 15 to 20 Novices. Nine passed the code test.

Membership: We now have 325 1980 members. Salley and Ted Nikkel are in Arizona with a health problem, it was reported. Ideas on how to help them are being solicited by Vern Hajek K6UGS.

Repeater Group does not have a 1981 Chairman and the group's secretary WA6MWU may have to act as chairman.

Christmas Party: Dee Koester KA6AOC reported that reservations are coming in.

The motion passed that \$250 be allowed for Dee's Christmas Party expenses.

FCC fees Aug. 1, 1970 to Feb. 28, 1975 are partially refundable, it was stated by K6IMV. For details refer to page 10 of Oct. QST.

K6XC has fifty forms for this.

Adjournment was at 9:12 p.m. for a coffee break and program (The Lure of Pitcairn), after which it was announced by K6IMV that Officers for 1981 (there being 78 ballots) are: WB6NMU Pres.; WA6TXM VP; KA6AOC Sec.; WA6YXY Treas.; WA6OFI EC; K6XC Board Memb. (and WA6GON holdover Board Member).

Motion passed that ballots be destroyed.

- W6CU Secretary pro tem

MINUTES OF THE NOV. 24 BOARD MEETING

QTH: O.E.S. 50 Glacier Drive, Martinez, CA
Time frame: 8:07 p.m. to 10:23 p.m.

Present: WA6IRZ, chairman plus W6CU, K6XC, WA6GON, WA6TXM, KA6AOC, WA6YXY, WA6DQN, WB6AEG, K6IMV, K6VLH, and WA2CEP.

Comments on the CARRIER from all persons present were solicited and obtained. All agreed it is a very superior paper. Problems are centered around what to do about overweight, cost of postage, and advertising. Notes on comments were made by WA6IRZ. There are some months (hopefully few) when too many ads, wordiness of contributors, inserts, or too many pictures push us into extra postage; and November's experiment with 3rd class mail resulted in slow or no delivery for some. New By Laws writeup is in the hands of N6DN. Treasurer's Report: \$625.65.

Awards: Sale of aluminum has augmented the original \$50 allocation. Total to be spent will be under \$100.

Door Prize Chairman WA6TXM reports \$119.45 on hand and would be very pleased to have an audit. It was agreed that:

Paul did a wonderful job with door prizes.

Membership: After the \$10 vote, 10 persons (2 new) rushed W2CU & WB6AEG with 1981 dues, depriving them of an adequate coffee break.

Motion passed these & five more be OKed.

A New Roster Update is desirable.

Club Property is restricting the available garage space of Jim Lissen WA2CEP.

Motion passed: Silent key plaque for Lou

Mangini W6KDB (member 1957-1979) be obtained.

Motion passed: Silent key plaque be obtained for a maybe overlooked silent key (name to be researched).

Christmas Party: Reservations for 34 so far. Stevens can't come. Will have meeting Dec.4.

- W6CU, Secretary pro tem

EXAM CORNER
by
Richard M. Bash - KL7IHP

This month we will examine a problem the F.C.C. lists on their syllabus for the Advanced Class applicant, "INTERMODULATION INTERFERENCE". Here at Bash Educational Services, we have received reports from many students that indicate that we should possibly delve into this area a bit more than has been done in the past. Additionally, this subject is repeatedly mentioned on both the local repeater and on the H.F. bands, so a little discussion of it here might enlighten us when on the air.

Intermodulation is referred to in ELECTRONIC COMMUNICATION (4th edition - published by Mc Graw-Hill) by Robert L. Shrader - W6BNB on pages 413 and 414. If you haven't purchased this book yet, I can strongly recommend it as an easy-to-read text that is one of the best you can get. It's not cheap (\$21.95) but neither are most things of high caliber. It is available through technical bookstores. If you can't find it call me at 415-352-5420 and we'll help you locate a copy of it.

Anyway, intermodulation interference occurs when two (or more) transmitters are close together and both are on the air simultaneously. Transmitter #1 is sending out its signal on frequency X and transmitter #2 sends its signal out on frequency Y. If these two transmitters are physically close enough (such as might be the case with a hill full of repeater transmitters), then the first transmitter can possibly send part of its energy into the antenna system of the second transmitter. Within the final of this 2nd transmitter we find frequency X and Y "intermodulating" or mixing together. The result of this mixing is the classic mathematical sum of X and Y as well as the mathematical difference between the two frequencies. We'll call these frequencies S (for "sum") and D (for "difference"). As if this isn't enough, we also get the harmonics of frequencies S and D!!!

By itself, this is not a concern for the F.C.C., but the mixing in the final amplifier circuit isn't the end of the problem. The F.C.C. gets concerned because some of these harmonics of S and D could be

radiated by the antenna system of the unit and then go on to create interference in the frequencies allocated to other services, such as the authorized commercial frequencies. Not only might the problem be brewing up in the final of transmitter #2 but transmitter #2 might be doing the same thing in transmitter #1's final amplifier circuit!!

Bob Shrader points out that if you'll put a WAVETRAP FILTER that's tuned to transmitter #2's frequency (in this case, frequency Y) on the first transmitter between the transmitter and the antenna, you'll eliminate the interference. Likewise, on transmitter #2, you'd install a wavetrapped filter set to frequency X (the first transmitter's frequency). What these wavetrapped filters will do is to prevent the other transmitter's energies from entering the "protected" transmitter's amplifier area. So, the transmitter that's having the problem is the problem is the one that really needs the filter.

The above information should give you more than enough information to answer the test questions and, more importantly, will allow you to discuss it more comfortably on the air. Please direct your questions and comments to me at Bash Educational Services, P.O. Box 2115, San Leandro, California 94577 or call me between 1800 and 0200 UTC, Monday through Saturday. Good luck and we'll see you again next month!

CLASSIFIED:

Mini-Quad; includes balun.

Good condition \$50.00

Norman Peterson, WD6GZZ

229-4912

Silent Key
Lou Mangini, W6KDB
MDARC Member
1957 to 1979



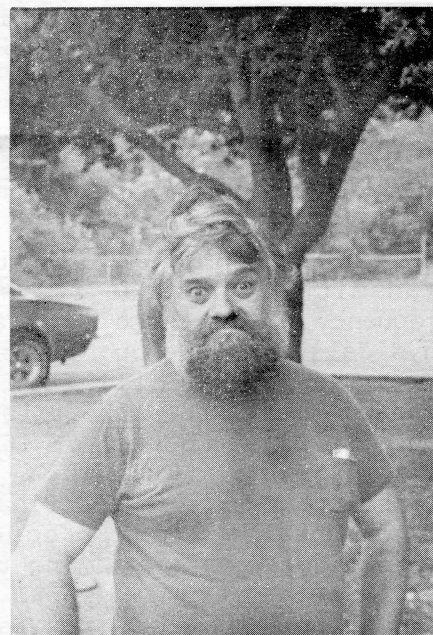
Retiring club president's wife, NORMA WELCH, WD6CVH, about to win watermelon eating contest.



Assorted club members and their families. Powerful communications equipment at lower left.



More club members enjoying their picnic lunch.



PETER STRAUSS, KO6R
Our most willing auctioneer!
(all we need is an auction)

Scott Miles, WB6PQM ~~was co-organizer~~ volunteered to organize the MDARC annual picnic which took place at the Walnut Creek Civic Park on August 23, 1980. Festivities commenced at 9:30 A.M. on this sunny Saturday morning with a fun filled T-hunt. Scott was assisted by Dee, KA6AOC and Judy KA6AHO, all of whom are to be commended for their planning and hard work. The turnout was not as great as had been hoped for but those attending had a thoroughly enjoyable time during this annual club event.

News from down south
THE SOUTHERN CHAPTER

By Jerry, WA6CUP

Well, for those who thought the boat from Sweden joined Davy's Locker in the depths of the North Sea, I have good news. Per Holking, SMØHEP is our featured Southern Chapter Member this month. He was finally able to get his photograph to us after several months of waiting for the photo lab to do their job! Per is 25 years old and was born in the southern part of Stockholm, capital city of Sweden. He attended local schools where he became proficient not only in his native tongue but in German and English as well. Per attended a local college and in 1974 began his current employment in the electronic repair business. In addition to amateur radio, Per enjoys hockey, soccer, running and girls (he's single).

Per holds his "A" class amateur license which he qualified for in 1979 after 3 years as a ham. He has achieved a 20 W.P.M. code proficiency certificate from the Nautical College in Stockholm. He earned a mixed DXCC award with 193 countries confirmed, running barefoot. He enjoys both DX and ragchewing.



Per's station consists of an FT-301 and a JR-599. The antennas are a TH3-MK3 at 45 feet and a windom for 40 and 80 meters. This photograph shows Per and his station. The CW key is vintage 1930 and is an L.M. Erickson group-type keyer. A homebrew, "Accukeyer" and split frequency control, are also visible in the photograph.

Per sent along information concerning two awards offered by Sveriges Sändareamatörer, the Swedish Amateur Organization. One is, Worked all SM's and the other is Worked all Swedish Laens (counties). I'm sure Per would be happy to provide this information to all fellow MDARC members.

He'd also like to hear from stateside hams who might share his interests in DX, etc. I'm sure he'd like to correspond with you. His address is: Per Holking, SMØHEP Stövargatan 77, S-12441 Bandhagen, Sweden, Europe.

By way of quick summary on other Southern Chapter activities, Betty, WB6SMF wife of Bob, W6TIO is recuperating at home from rather extensive surgery. A card to her at W6TIO's home address would be greatly appreciated.

The much discussed CQ DX WW contest effort from Radio Free Baker Oregon was a qualified success. We had a super time with Joe, Sharon and the kids. For the amount of time spent on the air we did fairly well. Joe managed to accumulate 37 new countries during the contest weekend at the expense of one Drake receiver. We're looking forward to another effort next year. Well folks, we'll see you again next month.

73, Jerry, WA6CUP

1980 DOOR PRIZES

Here's a big, "Thank You", to those firms who helped with our prizes this year. Special thanks to The Base Station in Concord, for the monthly discount on our regular prizes and for the \$250.00 in extra prizes, donated for the Christmas Party.

Special thanks also go to Ham Radio Outlet in Oakland for the grand prize for the Christmas Party and to Shaver Radio in San Jose for the 2M Transceiver donated for our last auction.

Thanks also to J & J Enterprises, W6HSY for the monthly Volt-I-Cator, to Quement Electronics in San Jose for more Christmas Party prizes and to the Odd Assortment in Pacheco for a few goodies earlier in the year.

Thanks too, to a few individuals for their contributions. I hope that I haven't forgotten anyone!

Please patronize the above firms and let them know that you know where the prizes come from!

One more big round of thanks to all of you who bought tickets throughout the year and kept the operation afloat!

Seasons Greetings,
Paul Taylor, WA6TXM

NEW MEMBERS SINCE PUBLICATION OF 1979-1980 MEMBERSHIP DIRECTORY

<u>CALL</u>		<u>NAME</u>	<u>PHONE</u>	<u>CALL</u>		<u>NAME</u>	<u>PHONE</u>
		William Arthur Ahlquist	229-1139	WA6SWO	G	John Keibel	
WA6DPJ	T	John E. Anslow	372-7777	KA6JEL		Pamela P. King	
KA6KSM	N	Forrest R. Armstrong	939-4096	KA6NAY	N	John Koehler	283-2791
KA6LCL	N	Tom E. Armstrong	939-4096	WA6ZFB	G	Leo C. Lewis	223-0301
		Edna Avent	937-2178	W6MDM	A	John M. McKillen	432-5227
KL7IHP		Richard M. Bash	352-5420	N6DHR	A	William Mohn	820-6952
KB6WM	A	David Bauerle (714)	581-6976	WB6DHN	G	Raymond B. Montagne	284-1327
KA6JPX	N	Duane A. Beddoes		KC4BN	A	James F. Perry	672-2251
WB2JDU	G	Robert R. Best	689-5495	WA6SEU	A	Philip E. Richardson	686-2185
KA6FEJ	G	Mark Burnham	686-4385	N6BLF	G	Walter E. Ridge	634-4045
		Edward E. Caine	525-7170	WB6PKH	G	Geary Ritchie	778-2393
		Laurence E. Caine	798-7743	KA6IXH	N	Arla Stevens	820-3702
WA6KDA	T	Vincent P. Cronin	837-3480	KA6SSX	N	Todd Stevens	820-3702
N6CKT	G	Keith L. Dicker (714)	832-5535	WA6JEF	T	Ronald W. Stuart	825-0345
KA6EEI	G	John T. Ebert	229-1264			Warren M. Sturgeon	
WA4LET	A	Edward Fischer	283-2150	WA6CIE	T	Lauren M. Styles	676-2186
		Harry Garces		K4IKT	A	Julius E. Tangel	798-6102
KA6KCN	N	Guy L. Gustafson	228-6611	K6IGJ	A	C.M. Unfried	687-1724
		Leland R. Hamilton	838-8550	WD6EGD	G	Gary S. Vanerstrom	686-0755
W6BFU	A	Jesse O. Hill	531-4886	WB5SER	A	John H. Waller	933-1138
SMØHEP	A	Per Holking		WA6HJB	E	Theo S. West	685-7649
KA6LBX	T	Roy M. Kappesser	686-6948	KA6MZS	N	Joseph A. Gilmour III	933-4881

QRM IDENTIFIED

Concord and Walnut Creek amateurs can receive cable TV on 2 Meters! Simply tune to 145.25 MHZ \pm 10KHZ. Cable TV in Concord indicates they use 145.25 MHZ for a television signal as part of their new twenty plus channel system. (The signal seems much stronger on 145.26)

In my home the carrier has been strong enough to capture the 145.25 rptr. completely! (WR6AXG, exact location unk.) The carrier is stronger in some areas and much weaker in others but it seems that it never quite dissappears no matter where I drive.

A definite opportunity now exists for a new type of RFI. I would think its possible for a strong signal in the 145 MHZ range to overload the TV converters and produce a very distorted picture!

I mentioned the possibility to Concord TV Cable but they didn't indicate any problem existed. They were however very concerned that a cable leak might be interfering with amateur radio communications. Shortly after my visit to the Cable Co., I noticed the signal level on 145.25 to be zero on my 7400 Kenwood (it was full scale). There is still a slight signal on 145.26. (one unit) They obviously took care of the leak. (Maybe even a potential interference problem from my station to TV converters.)

Amateurs with the new multi-channel service might experiment with this RFI possibility and let us all know the results.

Doug, WA6GON

THE BASE STATION

DENTRON RT-3000 Roller Inductor Tuner
\$299.50
DENTRON AT-3K 3KW Tuner \$259.50
DENTRON MLA-2500B Deluxe Amplifier
SPECIAL.... \$749.95

CUSHCRAFT ATB-34 Four Element 3 Band Beam
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AZDEN PCS-2000 2M Synthesized Transceiver
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MFJ 24 Hour Digital Clock..... \$29.95

AEA MM-1 Deluxe Contest Memory Keyer
\$199.95

DAIWA Meters From \$116.20

MFJ 752 Signal Enhancer..... \$84.95

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1981 DX CALLBOOK.....\$16.95 STOCK

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From... \$89.00

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KENWOOD TR-2400..... \$399.95

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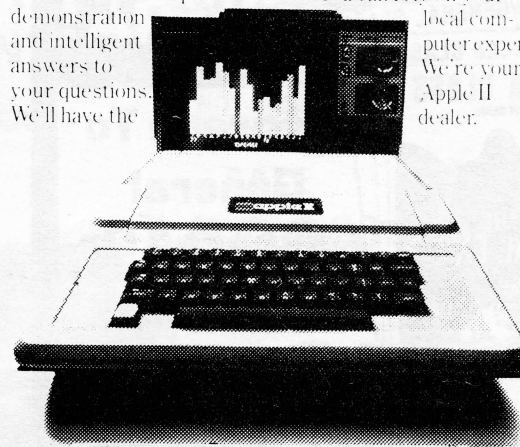
How to buy a personal computer.

There's only one smart
place to buy a personal
computer: from your local
computer expert.

Look to your Apple® II
dealer for efficient product
demonstration
and intelligent
answers to
your questions.
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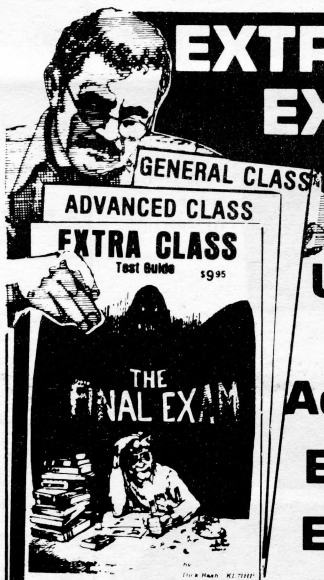
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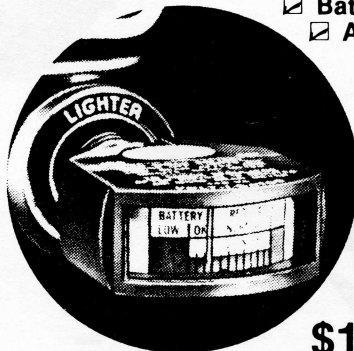
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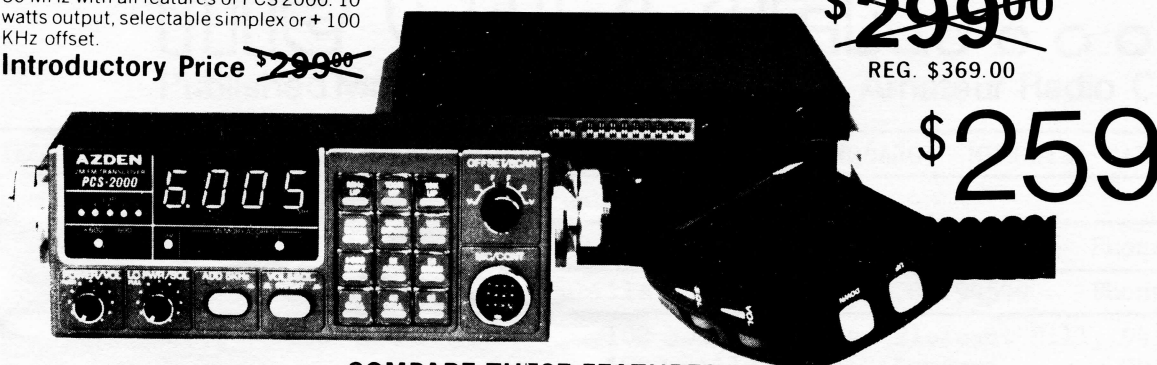
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